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Patent
Attorney's Docket No. P2428USX-722

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
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Bas ORDING	)	Group Art Unit: 2671
	)	
Application No.: 09/754,147	)	Examiner: M. Padmanabhan
	)	
Filed: January 5, 2001	)	Confirmation No. 3[illegible]
	)	
For: TIME-BASED, NON-CONSTANT TRANSLATION OF USER INTERFACE OBJECTS BETWEEN STATES	)	Appeal No.

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BRIEF FOR APPELLANT

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Commissioner for Patents
P.O. Box 1450
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Sir:

This appeal is from the decision of the Primary Examiner dated April, 22, 2003 (Paper No. 11), finally rejecting claims 1-5, 7, 8, 10-17 and 19-29, which are reproduced as an Appendix to this brief.

A check covering the [ ] $160.00 (2402) [X] $330.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in duplicate.

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I. Real Party in Interest

The inventor has assigned his rights to the invention that is disclosed in the application and any patent that may issue therefrom to Apple Computer, Inc., a corporation duly organized under and pursuant to the laws of California and having its principle place of business at One Infinite Loop, Cupertino, California 95014.

II. Related Appeals and Interferences

There are no other known appeals or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

The application contains 29 claims, of which claims 6, 9 and 18 were canceled, and claims 1-5, 7, 8, 10-17 and 19-29 are pending and the subject of the present appeal.

IV. Status of Amendments

Subsequent to the final Office Action, no amendments were filed. A Request for Reconsideration was submitted and the arguments therein deemed not persuasive by the Examiner.

V. Summary of the Invention

The claimed invention is directed to graphical user interfaces (GUIs) for computers, and more specifically the movement of GUI objects that are displayed to the user. For example, a common technique that is employed with GUIs involves "minimizing" and "maximizing" windows. The technique of minimizing and maximizing windows involves resizing and repositioning windows. When minimizing a window, the window is reduced in size to a miniaturized representation of the larger or full-sized window, or to an icon representation. When maximizing a window, the window is enlarged from a miniaturized representation of the window, or an icon representation, to a larger or full-sized window. As one skilled in the art will readily appreciate, a user may initiate the process of maximizing or

minimizing a window by selecting an on-screen button, typically associated with the window itself, or by depressing one or more keys on the keyboard. [Page 1, line 25 through page 2, line 6.]

With respect to manipulating windows (e.g., opening, closing, sizing, repositioning), conventional operating systems primarily focus on efficiency. However, operating systems do not focus on the aesthetics associated with these operations, particulary minimizing, maximizing and restoring operations. Accordingly, it would be desirable to provide more aesthetically pleasing operations, while continuing to provide all of the functionality associated with traditional techniques. [Page 2, lines 7-12.]

The invention provides more aesthically pleasing operations by carrying out the movement of user interface objects on the desktop, such as windows, icons, tiles, etc., in a time-based manner. In addition, this effect is independent of processor speed, so that a consistent look is presented regardless of the model of computer with which the user interface is used. [Page 12, lines 19-23]

According to this embodiment of the invention, a non-linear translation rate is employed, wherein the object appears to move slowly at the beginning and end of its path of movement, and faster during the middle portion of the movement. Thus, for instance, in the example of Figures 2A-2F, as the window 200 begins its downward movement from the state of Figure 2C, it begins slowly, then appears to move faster as it passes through the state of Figure 2D, and finally slows down again as it settles into its final position 220 shown in Figure 2F. [Page 12, line 24 through page 13, line 2.]

According to a preferred embodiment, a sinusoidal function is employed to provide this effect of acceleration and deceleration during the movement of the object. Referring to Figure 8, the total length of the translation that is to take place is depicted in a range of 0 to 1, and occurs over a duration of time T. Thus, in the example of Figures 2A-2F, the total vertical translation is equal to the distance S-Q. The amount that the object moves during each increment of time in this interval, e.g. every 30 milliseconds, can be viewed relative to movement along the periphery of a semicircle in equi-angular increments. For instance, if the interval T is divided into 8 segments, each interval corresponds to an arc of 22.5°, as shown

in Figure 9. When the end point of each arc is projected onto a linear axis, i.e. the diameter of the semicircle, the results indicate the amount of linear translation that takes place during each interval. As can be seen, the amount of movement that takes place during the first interval of time, $t_1 - t_0$, is significantly less than the distance traveled during the middle periods, e.g. $t_4 - t_3$ and $t_5 - t_4$. Similarly, the amount of movement in the later periods are also less than during the middle periods. As a result, the object appears to first accelerate and then decelerate over the total range of its motion. The semicircle, therefore, represents a non-constant velocity function over the path of movement along the axis. [Page 13, lines 3-18.]

To determine the instantaneous position of the object during movement in accordance with the foregoing approach, the following values are defined for movement in a direction of interest, e.g. along the x axis:

x_{start} -starting position of a reference point on the object (e.g. the upper left corner Q of the window illustrated in Figure 2A)

x_{end} - final position of the reference point on the object (e.g. the point S')

t_{start} - starting time for the translation

T - total duration for the translation

Once these values have been defined, the elapsed time is calculated as:

$$t_{elapsed} = t_{now} - t_{start} \qquad (1)$$

where t_{now} is the current time. Using this value, a distance factor F is computed as follows:

$$F = 0.5 - [0.5 \cos (\pi * t_{elapsed}/T)] \qquad (2)$$

This calculation results in a value in the range of 0 to 1, i.e. a point along the linear axis. This value is then used to determine the instantaneous position of the object, as follows:

$$x_{now} = x_{start} + (x_{end} - x_{start}) *F \qquad (3)$$

The procedure of Equations 1-3 is repeated during the period of time T, until the object has reached the final position. [Page 13, line 19 through page 14, line 6.]

A particular advantage of this technique for translating objects is the fact that it is based on time, and is independent of the processor speed of the computer on which the operating system is being run. Hence, a consistent appearance will be associated with the user interface across all models of computers, rather than appearing relatively sluggish on older,

slower computers or too fast to be perceived on newer, faster computers. [Page 14, line 10-14.]

While the preceding example has been particularly described with reference to the movement of a window, it will be appreciated that it is not limited to such. Rather, the non-linear translation can be applied to any object which is automatically moved in a user interface. For instance, if a user removes one of the tiles 260 in the userbar 270, or maximizes it into an open window, the other tiles can move horizontally to fill the gap created by the removed tile. Likewise, if a new tile is inserted in the userbar, or the relative positions of the tiles are changed, the existing tiles can move away from the tile being inserted to provide space for it to be accommodated. The movement of each tile can be controlled in accordance with the foregoing technique, to create a pleasing effect. Similarly, the dropping down of menus and any other type of movement animation that is automatically performed in a user interface can employ this effect. [Page 14, lines 15-25.]

Although a sinusoidal function has been identified since it produces a particularly interesting effect, any other function representing a velocity which increases and/or decreases over time, particularly a non-linear function, can be employed to produce a desired effect during the movement of the object. [Page 14, lines 26-29.]

VI. The Issues

A. Whether claims 1-5, 7, 8, 10, 20 and 21 were properly rejected under 35 U.S.C. § 102(b) as being anticipated by the Chang et al. article, "Animation From Cartoons to the User Interface", 1993, ACM 0-89791-628-X/93/0011 ("Chang").

B. Whether claims 14-17, 19, 25 and 26 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Chang.

C. Whether claims 11, 22 and 27 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Chang in view of the IBM TDB article, "Window Closing Animations", IBM Technical Disclosure Bulletin, US, IBM Corp, NY, 1 Nov 1995, ISSN 0018-8689 ("IBM article").

D. Whether claims 12, 13, 23, 24, 28 and 29 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Chang in view of U.S. Patent No. 5,796,402 to Ellison-Taylor ("Ellison-Taylor").

VII. Grouping of Claims

For purposes of this appeal: Claims 1 and 2 stand or fall together; Claim 4 stands alone; Claims 3, 7, 10 and 21 stand or fall together; Claims 5 and 8 stand or fall together; Claims 11, 22 and 27 stand or fall together; Claims 12, 13, 23, 24, 28 and 29 stand or fall together; Claims 14 and 15 stand or fall together; Claims 16, 19 and 26 stand or fall together; Claims 17 and 25 stand or fall together; and Claim 20 stands alone. The reasons the claims are grouped as above are explained below in the "Argument" sections.

VIII. Argument

A. Claims 1-5, 7, 8, 10, 20 and 21 Are Not Properly Rejected Under 35 U.S.C. § 102(b) As Being Anticipated by Chang.

It is well known that in order to support a rejection under 35 U.S.C. §102, each and every claimed element must be disclosed by the cited reference. In the present case, claims 1-5, 7, 8, 10, 20 and 21 are not anticipated by Chang for at least the reason that Chang fails to disclose each and every claimed element.

Chang discloses a user interface that employs cartoon animation principles in rendering/displaying interface objects. For example, to give a feeling of weight to objects and physicality to their movement, Chang employs a technique referred to as slow-in and slow-out rather than drawing objects *equally spaced* in space and time. As a result of this process, objects appear to move out of a position slowly, then quickly during the bulk of the movement, and then slowly into the ending position. (See page 50 and FIG. 8 of Chang). Chang applies this slow-in, slow-out animation technique to all movement within the user interface, for example, boxes and menus growing or shrinking, arrows growing or shrinking, and boxes entering and exiting offscreen. Chang is silent, however, as to how this slow-in, slow-out animation process is achieved in the user interface.

The present invention relates to graphical user interfaces, and more particularly to the movement of user-interface objects, such as icons and windows. The present invention provides an aesthetically pleasing visual effect when repositioning, resizing, or generally manipulating a displayed object, such as a window. For example, according to exemplary embodiments, when a window moves from a first position to a second position, the rate of translation is controlled in a non-linear manner (e.g., in accordance with a sinusoidal function) to provide the visually pleasing effect. In one embodiment, the object accelerates and then decelerates as it moves. The rate of acceleration and deceleration is *time-based*, so that the same type of effect is achieved on all computers, independent of their respective processor speeds.

1. Chang fails to disclose establishing a time-based velocity function.

Independent claim 1 defines a method for moving an object in a graphical user interface. The method includes, *inter alia*, the steps of: determining a path of movement for the object along at least one axis, and a period of time for the movement along said path; establishing a non-constant velocity function along said axis for said period of time; calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time; and displaying said object at said calculated position. Claim 2 depends from independent claim 1. Accordingly claims 1 and 2 stand or fall together.

In rejecting claim 1, the final Office Action ("Office Action") asserts that Chang discloses the steps of determining a path of movement for the object along at least one axis and *a period of time for the movement along said path*; establishing a *non-constant velocity function* along at least one axis for a period of time; and calculating an instantaneous position for the object along said path in accordance with said function and *the relationship of a current time value to said period of time* inasmuch as Chang discloses applying the slow-in, slow-out animation technique to a user interface. To support this position, the Office Action points to FIGs. 8 and 9 and the discussion of the slow-in and slow-out concept on page 51 of Chang. This assertion is unfounded for the following reasons.

Although Chang may disclose displaying an object at various positions between a starting position and an ending position wherein the distances between the positions are closer at the beginning and end than during the middle of the transition (illustrated in FIGs. 8 and 9), Chang fails to disclose that this slow-in, slow-out process is achieved by the claimed steps of: determining a period of time, establishing a non-constant velocity function for said period of time, and calculating an instantaneous position for the object along said path in accordance with the non-constant velocity function and the relationship of a current time value to the determined period of time. The passage cited by the Office Action (i.e., page 51 of Chang) does not disclose *how* the slow-in, slow-out effect is achieved.

Since Chang fails to explicitly disclose the steps of determining a period of time for the movement of the object along the path; establishing a non-constant velocity function along an axis for a period of time; and calculating an instantaneous position for the object along the path in accordance with the function and the relationship of a current time value to the period of time as claimed, it appears that the Office Action is asserting that these steps are inherent to the disclosure of Chang inasmuch as Chang appears to achieve a similar result (i.e., the appearance of a change in the speed of an object's movement).

Regarding the inherency of claimed limitations, section 2112 of the MPEP states: "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic."(emphasis in original). Furthermore, Ex parte Levy states:

> In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)

However, in the present case, the Examiner fails to provide any basis in fact or technical reasoning to support the determination that the slow-in, slow-out process disclosed in Chang is achieved by determining a period of time for the movement of the object along the path, establishing a non-constant velocity function and calculating an instantaneous position for the object along the path in accordance with the function as claimed. To the contrary the

Examiner merely points to various figures in Chang, which show various animation results, as disclosing specific steps for achieving the shown results. For example, the Office Action states that Figure 1 of Chang illustrates that the position of an object is "based on" time and velocity. However, this is not what FIG. 1 of Chang is disclosing. Rather, Figure 1 of Chang illustrates the *effect* that fast speeds (e.g., resulting from a sudden jerk of the mouse) have on the user's perception of continuous motion in a frame-based system. As a result, if an object moves more than half its size between any two frames, motion blur is added. (See discussion in column 2 of page 47). However, there is no disclosure or suggestion of determining a period of time for the movement along the path, or that a current time value is one of the parameters that is employed to determine the instantaneous position of an object based on a non-constant velocity function. Furthermore, the movement illustrated in FIG. 1 of Chang results from the corresponding movement of a mouse. Therefore, there is no need to determine a time period for the movement as it is a direct result of the speed of the mouse movement. Nor is there any need to establish a non-constant velocity function because the rate of change in the display is based on the mouse movement.

Finally, the claimed steps are not inherent to the disclosure of Chang for at least the reason that the claimed steps do not necessarily flow from the slow in, slow-out process of Chang. For example, regarding the claimed step of establishing a path of movement for the object along at least one axis and a period of time for the movement, Chang discloses that the slow-in, slow-out process is applied to *all* object movements, including stationary objects which change only in size, for example arrows or menus growing or shrinking (see column 1 page 51 of Chang). Accordingly, the slow-in, slow-out process of Chang is applied in situations where the object is stationary and therefore would not include the step of establishing a path as asserted by the Office Action.

Furthermore, the results of Chang may be achieved by various techniques or calculations based on speed alone, or distance alone. For example, the number of and distance between each object display may be based on the total distance to be traveled. Therefore, the non-constant velocity function and time calculation of the present invention do not *necessarily* flow from the teachings of Chang. As pointed out in the specification, one of

the advantages achieved by the present invention is the fact that the movement of an object is independent of the speed of the processor[1]. Nothing in Chang discloses how to achieve such consistency across disparate computing platforms. Accordingly, Chang fails to anticipate claim 1.

2. Chang fails to disclose that the distance between successive positions of the displayed object varies in accordance with a non-linear function.

Independent claim 5 defines a method of moving an object in a graphical user interface that includes, *inter alia*, displaying the object at sequential positions along a path from a starting location to a final location at increments of time, such that the distance between successive positions varies in accordance with a *non-linear function* so that the object appears to be moving at a changing velocity. Likewise, independent claim 8 defines a user interface comprising means for carrying out the steps of claim 5. Accordingly, claims 5 and 8 stand or fall together.

In rejecting claims 5 and 8, the Office Action asserts that Chang discloses a method for moving an object in a graphical user interface that includes the steps of identifying a starting location, selecting a final location, and displaying the object at sequential positions a long a path from the starting location to the final location at increments of time such that the object appears to be moving at a changing velocity. Although, the Office Action fails to address the claimed feature of the distance between successive positions varying in accordance with a non-linear function, the Office Action appears to assert that the slow-in, slow-out process discussed in Chang inherently discloses that the distance between successive displays varies in accordance with a non-linear function (see rejection of claim 2). This assertion is unfounded for the following reasons.

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[1]The Office Action states that this feature of the invention is not claimed. Applicant respectfully submits, however, that it is implicit in the claim because it is a result of the process recited in the claims. Namely, the time-based determination of an object's position is what enables the effect to be independent of processor speed.

ND

Because Chang fails to disclose how the slow-in, slow-out process is achieved in the user interface, the Office Action must provide some basis in fact or technical reasoning to support the conclusion that the distance between the successive positions illustrated in FIGs 8 and 9 varies in accordance with a *non-linear function* as claimed. In the present case, however, the Examiner fails to provide such evidence. Accordingly, the rejection is improper.

Furthermore, the traditional animation techniques that Chang applies to the user interface were traditionally achieved through the creation of multiple animation cells, i.e., individual displays that were sequentially projected at a particular frame rate. As a result, the animation techniques discussed in Chang were achieved based on the amount of change between the individual animation cells. For example, the slow-in, slow-out process discussed in Chang would have been achieved by varying the *distance* in the object's position in each successive cell, not based on a non-linear function. Accordingly, the claimed steps do not necessarily flow from the disclosure of Chang.

3. Chang fails to disclose that the distance between successive position of the displayed object varies in accordance with a sinusoidal function.

Dependent claims 3, 7, 10 and 21 recite, in addition to the limitations of their respective base claims, that the velocity function is a *sinusoidal function*. Accordingly, claims 3, 7, 10 and 21 stand or fall together.

In rejecting claims 3, 7, 10 and 21, the Office Action asserts that Chang *implicitly* teaches the function is a sinusoidal function since Chang teaches the velocity of the object increases gradually to a maximum value in the slow-in phase, and then decreases gradually, similar to a sine function. This assertion is unfounded for the following reasons.

First, it is improper to reject a claim under 102(b) as being anticipated by prior art which by the Examiner's own admission only "implicitly" discloses the claimed limitations. Second, nowhere in Chang is there any disclosure that "the velocity of the object increases gradually to a maximum value in the slow-in phase, and then decreases gradually" as asserted by the Office Action. To the contrary, Chang only discloses that "characters move out of a

pose slowly, then quickly during the bulk of the entire movement, and then slowly into the ending pose." (See page 50, section 2.3.1 of Chang) Nowhere in Chang is there any disclosure of increasing the *velocity* of the movement to a maximum value and then decreasing it gradually. As discussed above, Chang fails to provide any disclosure of a velocity function, much less that it is sinusoidal.

Finally, even if one where to interpret the varying distances of Chang as varying velocity, nowhere in Chang is there any disclosure that the distance/velocity varies in accordance with a sine function. The alleged disclosure in Chang of increasing the velocity to a maximum and then decreasing of the velocity could be achieved in accordance with any number of functions. For example, assuming, *arguendo*, that the system of Chang employed a velocity function, the velocity function could be a step function and still achieve the slow-in, fast middle, slow-out effect. Accordingly, varying the velocity in accordance with a sine function does not necessarily flow from the disclosure of increasing the velocity to a maximum and then decreasing it as allegedly disclosed in Chang.

4. Chang fails to disclose calculating a ratio of the elapsed time to the total time duration and applying the ratio to a non-constant velocity function to determine a translation factor.

Claim 4 recites, in addition to the limitations of claim 1 from which it depends, that a ratio of the elapsed time to the total time duration is calculated and applied to the velocity function to determine a translation factor. Accordingly, claim 4 stands alone.

In rejecting claim 4, the Office Action asserts that the claims steps are "known as taught by Chang, since Chang displays translation from initial position to current position based on time, distance and velocity." This assertion is unfounded for the following reasons.

Again, the Office Action fails to provide any basis in fact or technical reasoning to support the conclusion that the claimed steps of calculating a ratio, applying it to a velocity function, and determining a translation factor *necessarily* flow from the disclosure of Chang. Furthermore, nowhere in any is there any disclosure or suggestion of the translation from initial position to current position based on "time, distance and velocity" as asserted by the Office Action. To the contrary, cartoon animation techniques (which Chang applies to

graphical interfaces) were historically created two-dimensionally using hand drawn frames, not velocity calculations and translations factors as claimed.

5. Chang fails to disclose the steps of selecting a period of time within which the object is to move.

Independent claim 20 recites a user interface that includes, *inter alia*, means responsive to a user action for selecting a location to which said object is to be moved and a period of time during which the movement is to occur, and for moving the object from a first location to the second location at a non-linear rate of movement during said period of time.

In rejecting claim 20, the Office Action asserts that claim 20 is a user interface claim for a combination of claims 1 and 2, and therefore is rejected with the same rationale as claims 1 and 2. However, claims 1 and 2 are patentably distinguishable over Chang for at least those reasons presented above. Furthermore, nowhere in Chang is there any disclosure of selecting a period of time within which is the object is to be moved, much less that the rate of movement during said period of time is non-linear. (See discussion above.)

For at least those reasons presented above, claims 1-5, 7, 8, 10, 20 and 21 are not anticipated by Chang.

B. Claims 14-17, 19, 25 and 26 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious over Chang.

It is well known that in order to support a rejection under 35 U.S.C. §103, three basic criteria must be met. One of these basic criteria is that the combination must teach each and every claimed limitation. In the present case, claims 14-17, 19, 25 and 26 patentably distinguishable over Chang for at least the reason that Chang fails to disclose or suggest each and every claimed element as discussed below.

Independent claim 14 defines a computer-readable medium containing a program which executes steps substantially similar to the steps of method claim 1. In addition, claim 15

depends from independent claim 14. Accordingly, claims 14 and 15 are patentably distinguishable over Chang for at least those reasons presented above with respect to claim 1.

Independent claims 17 and 25 define a computer-readable medium containing a program and a user interface, respectively, which executes/implements steps substantially similar to the steps of method claim 5. Accordingly, claims 17 and 25 are patentably distinguishable over Chang for at least those reasons presented above with respect to claim 5.

Dependent claims 16, 19 and 26 recite, in addition to the limitations of their respective base claims, that the velocity function is a *sinusoidal function*. Accordingly, claims 3, 7, 10 and 21 stand or fall together.

The Office Action rejects claims 16, 19 and 26 based on the same rationale as claims 3 and 7. However, as discussed above, the rejection of claims 3 and 7 is unfounded. Therefore, claims 16, 19 and 26 are patentable distinguishable over Chang for at least those reasons presented above with respect to claims 3 and 7.

Accordingly, absent some evidence that the claimed elements necessarily flow from the disclosure of Chang or that one skilled in the art would have been motivated to modify the teaching of Chang to include said elements, the rejection of claims 14-17, 19, 25 and 26 is improper.

C. Claims 11, 22 and 27 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious Over Chang in View of The IBM Article.

The IBM article discloses that various animated effects, such as shattering like a pane of glass, or melting as if exposed to intense heat, can be employed in a user interface to provide feedback to a user after initiating an operation to close a window. However, the IBM article fails to overcome the deficiencies of Chang discussed above with regard to independent claims 8, 20 and 25, from which claims 11, 22 and 27 depend respectively. More specifically, the IBM article fails to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a *non-linear function* as recited in claim 11, or means for *selecting a period of time* for moving the object

and for moving the object at a *non-linear rate of movement* during the period of time as recited in claims 22 and 27.

In rejecting claims 11, 22 and 27, the Office Action asserts that since the IBM article teaches animations for minimizing a window, it would have been obvious to one skilled in the art "to incorporate the animation for minimizing the window in the invention of Chang, in order to provide effective feedback on user action." However, the Office Action fails to address how the window closing feedback animations of the IBM article overcome the deficiencies of Chang.

Since both Chang and the IBM article fail to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a non-linear function as recited in claim 11, or means for selecting a period of time for moving the object and for moving the object at a non-linear rate of movement during the period of time as recited in claims 22 and 27, the combination of these two documents cannot possibly disclose or suggest said features. Therefore, even if one skilled in the art were motivated to combine Chang and the IBM article, as suggested by the Office Action, the combination would still fail to render claims 11, 22 and 27 unpatentable for at least the reason that combination fails to disclose each and every claimed element.

D. Claims 12, 13, 23, 24, 28 and 29 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious Over Chang in View of Ellison-Taylor.

Claims 12, 13, 23, 24, 28 and 29 recite, in addition to the features of their respective base claims, that when the user action results in the removal/insertion of one object from/into a series of objects, means responsive to the user action causes other objects in the series to move toward/away from the deleted/inserted object.

Ellison-Taylor discloses a method of automatically aligning windows on a computer screen. However, Ellison-Taylor fails to overcome the deficiencies of Chang discussed above with respect to claims 8, 20 and 25, from which claims 12, 13, 23, 24, 28 and 29 variously depend.

In rejecting claims 12, 13, 23, 24, 28 and 29, the Office Action asserts that because Ellison-Taylor discloses a tiling program that aligns windows based on the relative position and size of the window when a request is made, Ellison-Taylor implicitly discloses moving objects in a series toward the space occupied by the removed object when an object is removed, and away from the inserted object when an object is inserted. Therefore, according to the Office Action it would have been obvious to one skilled in the art "to incorporate the tiling of Ellison-Taylor in the invention of Chang, so that the object may be displayed in their final positions without overlap, so that all the objects in the display area are visible to the user concurrently." However, the Office Action fails to provide any basis in fact or technical reasoning to support the determination that the tiling program of Ellison-Taylor moves objects in a series toward the space occupied by the removed object when an object is removed, and away from the inserted object when an object is inserted.

The tiling program disclosed by Ellison-Taylor repositions and arranges the currently displayed windows of a user-interface. Nowhere in Ellison-Taylor is there any discussion of the tiling program being initiated upon the removal or addition of a window. Accordingly, the concept of moving objects in a series toward the space occupied by the *removed object* when an object is removed, and away from the *inserted object* when an object is inserted, does not necessarily flow out of the disclosure of Ellison-Taylor.

Furthermore, since both Chang and Ellison-Taylor fail to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a non-linear function as recited in claim 8, or means for selecting a period of time for moving the object and for moving the object at a non-linear rate of movement during the period of time as recited in claims 20 and 25, the combination of these two documents cannot possibly disclose or suggest said features. Therefore, even if one skilled in the art were motivated to combine Chang and Ellison-Taylor as suggested by the Office Action, the combination would still fail to render claims 8, 20 and 25, from which claims 12, 13, 23, 24, 28 and 29 depend, unpatentable.

IX. Conclusion

In view of the foregoing, it is respectfully requested that the rejection of claims 1-5, 7, 8, 10-17 and 19-29 be reversed.

Respectfully submitted,

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APPENDIX A

The Appealed Claims

1. A method for moving an object in a graphical user interface, comprising the steps of:

a) determining a path of movement for the object along at least one axis, and a period of time for the movement along said path;

b) establishing a non-constant velocity function along said axis for said period of time;

c) calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time;

d) displaying said object at said calculated position; and

e) iteratively repeating steps (c) and (d) during said period of time.

2. The method of claim 1 wherein said function is a non-linear function.

3. The method of claim 2 wherein said function is a sinusoidal function.

4. The method of claim 1 wherein said calculating step comprises the steps of:

determining the amount of time that has elapsed since the beginning of said period of time;

calculating the ratio of said elapsed amount of time to the total duration of said period of time;

applying said ratio to said function to determine a translation factor; and

using said translation factor to determine the instantaneous position of the object along said path.

5. A method for moving an object in a graphical user interface, comprising the steps of:

identifying a starting location for the object;

selecting a final location for the object;

displaying said object at sequential positions along a path from said starting location to said final location at increments of time, such that the distance between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity.

7. The method of claim 5 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along said path.

8. A user interface for a computer, comprising:

a display space within which objects are displayed; and

means responsive to a user action for moving an object displayed in said space from a first location to a second location by displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity.

10. The user interface of claim 8 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

11. The user interface of claim 8 wherein said user action is a command to minimize a window.

12. The user interface of claim 8 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object.

13. The user interface of claim 8 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object.

14. A computer-readable medium containing a program which executes the following steps:

a) displaying at least one object in a display space;

b) determining a path of movement for the object along at least one axis within the display space, and a period of time for the movement along said path;

c) establishing a non-constant velocity function along said axis for said period of time;

d) calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time;

d) displaying said object at said calculated position; and

f) iteratively repeating steps (d) and (e) during said period of time.

15. The method of claim 14 wherein said function is a non-linear function.

16. The method of claim 15 wherein said function is a sinusoidal function.

17. A computer-readable medium containing a program which executes the following steps:

displaying at least one object at a first location in a display space;

selecting a second location for the object within said display space, and a period of time within which the object is to move from the first location to the second location;

displaying said object at sequential positions along a path from said first location to said second location at increments of time within said period, such that the distance between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity along said path.

19. The method of claim 17 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along said path.

20. A user interface for a computer, comprising:

a display space within which an object is displayed at a first location; and

means responsive to a user action for selecting a second location to which said object is to be moved and a period of time during which the movement is to occur, and for moving

said object from said first location to said second location at a non-linear rate of movement during said period of time.

21. The user interface of claim 20 wherein said non-linear rate is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

22. The user interface of claim 20 wherein said user action is a command to minimize a window.

23. The user interface of claim 20 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object at said non-linear rate.

24. The user interface of claim 20 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object at said non-linear rate.

25. A computer having an operating system that includes a user interface which implements the following steps:

displaying an object at a first location within a display space;

selecting a second location to which said object is to be moved and a period of time during which the movement is to occur in response to a user action; and

moving said object from said first location to said second location at a non-linear rate of movement during said period of time.

26. The computer of claim 25 wherein said non-linear rate is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

27. The computer of claim 25 wherein said user action is a command to minimize a window.

28. The computer of claim 25 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object at said non-linear rate.

29. The computer of claim 25 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object at said non-linear rate.

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